

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Walter Fleischmann, et al.	Examiner:	Hargobind S. Sawhney
Serial No.:	10/731,344	Art Unit:	2875
Filed:	December 9, 2003	Docket:	17240
For:	LIGHTING SYSTEM FOR AIRCRAFT CABINS	Dated:	March 1, 2007

Confirmation No.: 3553

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION PURSUANT TO 37 C.F.R. §1.131

Sir:

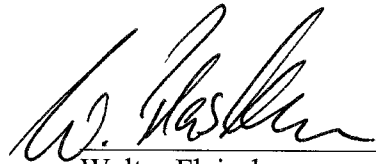
We, WALTER FLEISCHMANN, MARKUS STÖFFLER AND DIRK-ACHIM SCHEVARDO, hereby declare that:

1. We are the applicants of United States Patent Application No.10/731,344, filed on December 9, 2003, which claims the priority of German Patent Application No. 103 02 322.4, filed January 20, 2003.
2. We completed the invention disclosed and claimed in the German application, from which priority is claimed herein, prior to January 15, 2003, which is the filing date of United States Publication No. 2004/0135522 A1 (now United States Patent No. 7,148,632 B2), cited as a reference under 35 U.S.C. §103(a) against the present application by the Examiner.

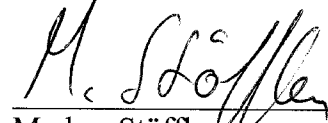
3. The completion of the present invention consisted of the preparation of and timely filing of German Patent Application No. 103 02 322.4, and the filing of the present application duly claiming the date of the filing of the German application under the provisions of the International Convention to which both Germany and the United States are signatories, and wherein a certified copy of the German application has been duly filed in the present application.
4. As evidence thereof, annexed hereto and made a part of this Declaration, is an Exhibit A, consisting of a photocopy of the Invention Disclosure by the applicants entitled "Panel Integrated Lighting System" and comprising eight (8) pages of specification and data.
5. All of the salient features of applicants' German and United States patent applications are fully described in the annexed Exhibit A.
6. The disclosure material, as set forth in Exhibit A, fully and comprehensively describes the subject matter on which the German and United States patent applications are based, in setting forth the circuitry and functioning components of the invention.
7. The expedient preparation and filing of the German and United States patent applications, based on the Invention Disclosure of the applicants, fully meets the requirements of the United States patent laws in applicants' compliance with a timely and expedient reduction to practice of the present invention from the time of the disclosure thereof.

8. All of the foregoing activities in the preparation of the German application, from which priority is claimed herein, were conducted by applicants prior to January 15, 2003, or under applicants direct supervision.
9. We further declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: 2.2.2007


Walter Fleischmann

Dated: 8.2.2007


Markus Stöffler

Dated: 5.2.2007

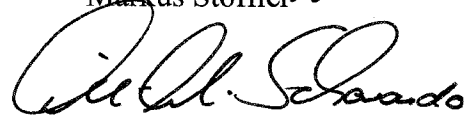

Dirk-Achim Schevarado

EXHIBIT A

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Panel Integrated Lighting System

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Configuration**Panel Integrated Lighting System**DOCUMENT NO. 0208603
ISSUE Draft V0.1
[REDACTED]

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Release Note

Prepared:

(DLE-VE): Dirk-Achlm Schevardo

Dept.

Date

Signature

Checked:

(DLE-x)

Dept.

Date

Signature

Released:

(DLE-x)

Dept.

Date

Signature

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1. RELATED DOCUMENTS

If not otherwise stated reference is made to the following documents:

- [1] Specification 0208601: PILS - LED-Chain

1.1. List of Abbreviations

A	Ampere
AC	Aircraft
CIDS	Cabin Intercommunication Data System
DC	Direct current
DLE	DIEHL Luftfahrt Elektronik
e.g.	For example
Etc.	Et cetera
LED	Light Emitting Diode
LISA	Lighting Interface Standardisation Adapter
PILS	Panel Integrated Lighting System
PWM	Pulse Width Modulation
V	Volt
WS	White

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2. GENERAL

This specification describes the integration of LED as a lighting system in aircraft panels.
The LEDs can have different colours for signs etc. Including white for illumination.

The LEDs can be placed in different arrays like arrows, logos, starry sky and so on.
The LEDs can be dimmed, sparkle and blink.

With this arrangements there are various possibilities to arrange the LEDs as illumination, effect-light, signs and so on.

3. PILS AS EFFECT LIGHT

There shall be various effects to meet special requirements.

3.1. Colour

The LED can have any available colour.

There can also be a filter to adapt the colour of the LED to the required colour.

The use of RGB-LED in one housing is also applicable as a mixture of red, green and blue LEDs.

3.2. Dim

The LED shall be dimmable to adapt the brightness to the requirements of different scenarios in the cabin of the AC.

The dimming shall be with soft smoothly transition and shall be adapted to the human eye.

3.3. Brightness

The brightness of the LED shall be changeable very quickly so that for the human eye there are different effects:

3.3.1. Sparkle

The brightness of the LED shall change in a specific manner so that there is a sparkle effect for the human eye.

3.3.2. Blink

The brightness of the LED shall change in a specific manner so that there is a blink effect for the human eye.

3.4. Running light

In a chain of LEDs mounted in a panel one LED after the next shall be illuminated to get the effect of a "running light point".

There can be only one LED illuminated at one time and all the other LEDs of the chain are off, or all LEDs have a specific brightness and the "running light point" is brighter or darker.

There can also be a "running light wave" which means that the LEDs in front and back of the brightest running light point have nearly the same brightness.

The speed of the "running light point" shall be adaptable.

3.4.1. Escape Path Marking

The running light could be used for marking the escape route to show the passengers where the nearest exit is and which direction to go.

The exit shall be marked with different coloured LEDs.

3.4.2. Special Layout

The running light can also be used for signs like arrows to show the direction with more effect, or just for ornaments with effect e.g. a star sparkling from inside to outside.

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4. ASSEMBLY AREA

The LEDs are placed in a panel to meet special requirements and could be arranged like the following points:

4.1. Vanish effect

The LEDs can be installed in a panel with a light conductor made by transparent or semi-transparent material with a small diameter for light output.
If the LED is switched off the light output is so small, that it can not be seen.

4.2. Illumination

The LEDs can be arranged to illuminate.

4.3. Ordinance**4.3.1. Signs**

The LEDs can be arranged like various signs, e.g. arrows, no smoking signs, toilet:



Drawing 3-1: examples of signs

4.3.2. Logos

The LEDs can be arranged like a logo of a company.

4.3.3. Shape of Lightoutput of each LED

There are different shapes of each LED light output possible:



Drawing 3-2: examples of light output shapes

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5. CONSTITUENTS

The PILS consists of several constituents to generate the effect.

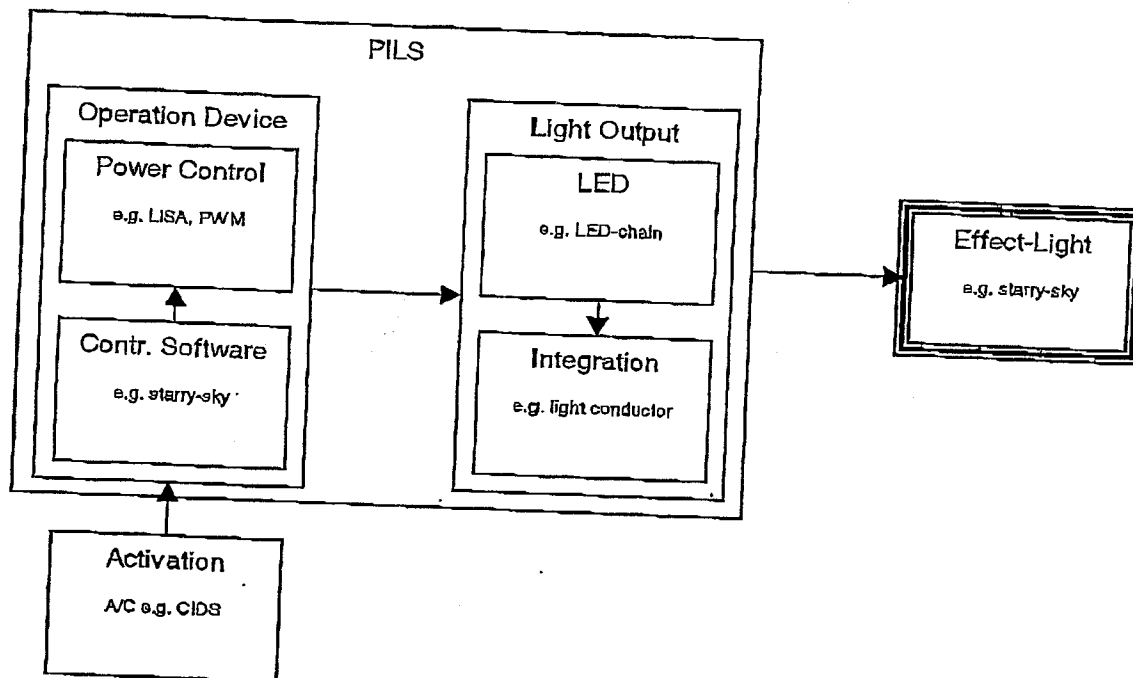


Figure 4-1: scheme of PILS

The effect light is activated by an external input to the Operation Device. This input could be a CIDS-command, a button or a switch when a door opens etc.
In the operation device the integrated software controls the power source which drives the LEDs. This could be a LISA with e.g. PWM-card.
The light output could be a LED-chain whose LEDs are integrated with a light conductor in a panel.
The integration shall be done by preventing e.g. ESD, vibration.

6. PN & LABELING

The Labelling of the constituents of PILS shall be on every single constituents. Therefore refer to the specification of these parts.

7. QUALIFICATION

Every constituents of PILS shall be qualified by itself. Therefore see the special spec of these parts.

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APPENDIX A: PILS APPLICATIONS

A.1. Starry Sky

The starry sky shall be realised with LED-chains.

There shall be background stars and some star constellation.

The background stars shall have a specific brightness and portions of the background stars shall be sparkling.

The star constellation shall have a specific brightness which is brighter than the background stars.

The stars shall be made of LEDs integrated in a panel and protected by a light conductor against ESD. There shall be 5 LEDs in a row with a current limiting resistor, power source and ESD-protection module.

Please refer to [1] and [2].

A.1.1. Activation

The starry sky shall be activated by a CIDS command.

A.1.2. Operation Device

The brightness of the stars shall be controlled by PWM.

A.1.3. Power Control

The PWM can be created by the PWM-card of the LISA.

Each PWM-card has got 2 outputs with each 3A resilience.

A.1.4. Control Software

Each output of the PWM-module of the LISA shall be controlled by the Integrated LISA software.

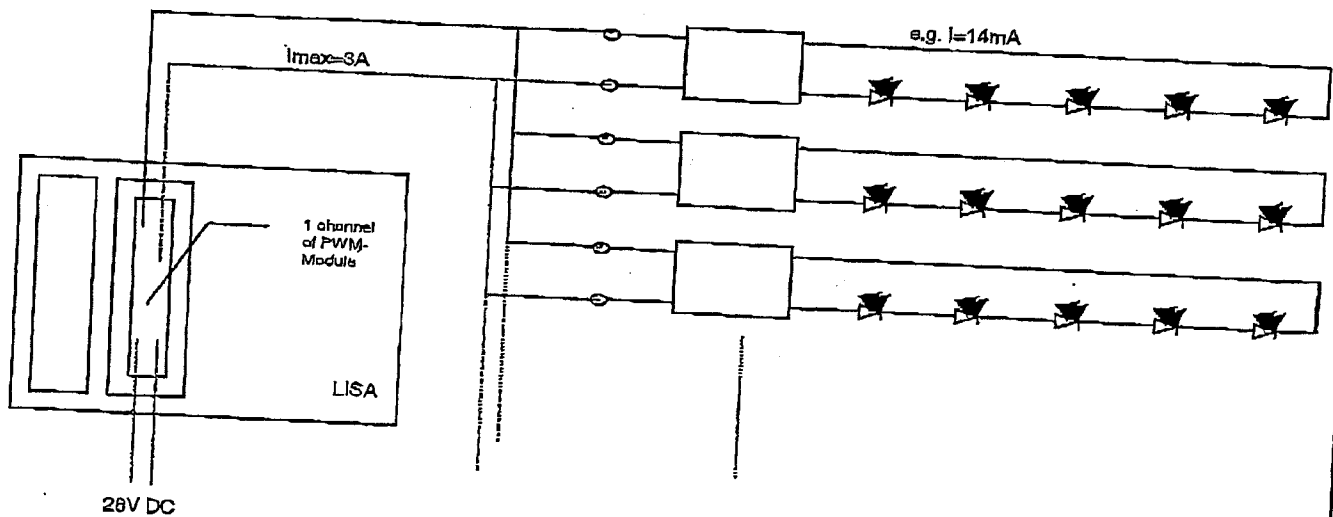
A.1.5. LED-Chain

LED chain which can be used for mounting directly in panels.

Each chain consists of 5 LEDs with ESD-protection module and power regulator.

The voltage put to the LED-chain shall be 28V and the current is controlled by the power regulator to 14mA.

The brightness of the LEDs shall be controlled by PWM.



Calculation: $255 \text{ LED-chains} \times 14\text{mA} = 3,57\text{A} \Rightarrow 2 \text{ channels are required}$
 $10 \text{ LED-chains} \times 14\text{mA} = 0,14\text{A} \Rightarrow 1 \text{ channel is required}$

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